REMARKS/ARGUMENTS

Claims 1, 4, 7 and 9-17 are pending herein. Claims 2, 3 and 8 have been cancelled without prejudice or disclaimer, and the subject matter thereof has been incorporated into independent claim 1. New claim 12 has been added as supported by claims 1, 2, 5 and 8, and new claims 13-17 have been added as supported by claims 6, 7 and 9-11, respectively.

1. Claims 1, 2 and 9-11 were rejected under §103(a) over Chiu in view of Bernier, claims 3-6 were rejected under §103(a) over Chiu in view of Bernier and further in view of Ishikawa, and claim 8 was rejected under §103(a) over Chiu in view of Bernier and further in view of Achari. To the extent these rejections might be applied against the amended claims, they are respectfully traversed.

Claim 1 recites a heat spreader member comprising a base, a heat spreader member joined on the base, and an insulating substrate arranged on the heat spreader member. The base, the heat spreader member, and the insulating substrate are joined with a hard solder material having a melting point of not less than 600°C. The base includes a copper alloy, which has a proof stress of not less than 45 MPa and a coefficient of thermal conductivity of not less than 270 W/mK when subjected to a heat treatment between 600° and 900°C for 10 minutes. The copper alloy of the base is any one of the six alloys recited in claim 1.

The Examiner correctly indicated that Chiu fails to disclose the specific material used for the base and that Bernier does not disclose the material properties of the copper alloy base. For these two features, the Examiner incorrectly referred to Table 1, Properties and Selection: Nonferrous alloys and special purpose materials, Volume 2, ASM Handbook, and provided thermal conductivity data for some sample copper alloys from the same Handbook. These materials disclose the proof stress and the coefficient of thermal conductivity of copper alloys taken at **room temperature**. These materials do not disclose the material properties of any of the copper alloys **when subjected to a heat treatment between 600° and 900°C for 10 minutes**. Furthermore, these materials do not provide one skilled in the art with any motivation

to further test and define material properties of the copper alloys after when subjected to a heat treatment between 600° and 900°C for 10 minutes.

The Examiner apparently misunderstands the recited claim language "when subjected to a heat treatment between 600° and 900°C for 10 minutes." This becomes apparent when the Examiner states, in the paragraph bridging pages 3 and 4 of the Office Action, that "it would have been obvious to one of ordinary skill in the art to heat treat the alloy at the optimum time and temperature based upon routine experimentation to determine the best thermal coefficient of conductivity." This, combined with the Examiner's statement on page 3 of the Office Action that "with regard to the recited heat treatment temperature and time of the base, the determination of patentability of the product is based on the product itself and does not depend upon its method of production," clearly shows that the Examiner interprets the heat treatment to be part of the manufacturing process of the copper alloy. This is completely incorrect.

The Examiner is respectfully requested to note that the recited temperatures and time are not a method of production for the copper alloy. The recited claim language requires that the copper alloy **exhibit the recited physical characteristics when being subjected to the recited temperature and time**, which are observed when the copper alloy base is being assembled with other components using a hard solder having a melting point of not less than 600°C. The recited temperature and time do not in any way relate to the method of production or manufacture of the copper alloy itself; they relate to physical characteristics that are exhibited by the claimed copper alloy when subjected to these conditions.

Furthermore, Chiu, Bernier, and the ASM Handbook all fail to disclose or suggest that the overall success of an assembly process using hard solder to join a copper alloy base depends upon the particular physical characteristics of the copper alloy base measured while the copper alloy base has been subjected to an elevated temperature between 600° and 900°C for 10 minutes. Therefore, this claimed feature

is not disclosed in Chiu, Bernier or the ASM Handbook to be a result-effective variable.

Referring now to the hard solder feature recited in claim 1, as discussed above, the Examiner correctly asserts that Chiu fails to disclose the specific material used for the base and Bernier fails to disclose the material properties of a copper alloy base. Additionally, the Examiner asserts on page 7 of the Office Action that Chiu and Bernier fail to disclose that the base, the heat spreader member, and the insulating substrate are joined with a hard solder with a melting point not less than 600 ° C. For this feature, the Examiner apparently relies on Table 1, number 3 of Achari.

Number 3 of Achari is an example used by Achari to show what does not work in an electrical device. Achari discloses in column 1, lines 59-62 that electrical solders "should generally have a narrow melting range in lower melting temperatures to protect the substrates and electrical components." Achari further discloses, in column 2, line 21 -- column 3, line 6, that the vast majority of electronics manufacturing activities use solder having a melting temperature of 183°C and that the desired lead free solder has a melting temperature of 220°C or less. Clearly, Achari does not disclose or suggest that a base, a heat spreader module, and an insulating substrate should be joined with a hard solder material having a melting point of not less than 600°C.

For at least the reasons stated above, a heat spreader module, as recited in claim 1, would not have been obvious to one skilled in the art given the disclosures of Chiu, Bernier, Ishikawa, Achari and the ASM Handbook. Since claims 4-6 and 9-11 depend either directly or indirectly from claim 1, those claims are believed to be allowable over the applied prior art. Moreover, new claims 12-17 are allowable for the same reasons explained above. Accordingly, reconsideration and withdrawal of all grounds of rejection based on the applied references are respectfully requested.

2. Claim 7 was rejected under §103(a) over Chiu and Bernier in view of Tobita. Applicants respectfully submit that the arguments submitted above distinguish claim 1 from Chiu and Bernier. Since Tobita does not overcome the deficiencies of Chiu and

Bernier, and since claim 7 depends directly from claim 1, claim 7 is also believed to be allowable over the applied prior art.

In closing, during a telephone conference on August 11, 2006, SPE Feild explained that Examiner Thompson is on leave, that a temporary Examiner would be assigned to this case, and that she would not grant an interview after Final Rejection. The temporary Examiner is requested to telephone Applicants' undersigned representatives in the event the PTO intends to issue an Advisory Action in response to this paper.

If the PTO believes that contact with Applicants' attorney would be advantageous toward the disposition of this case, the appropriate official is herein requested to call Applicants' attorney at the phone number noted below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

Respectfully submitted,

August 25, 2006
Date

Stephen P. Burr
Reg. No. 32,970

Timothy D. Evans
Reg. No. 50,797

SPB/TE/tlp

BURR & BROWN
P.O. Box 7068
Syracuse, NY 13261-7068

Customer No.: 025191
Telephone: (315) 233-8300
Facsimile: (315) 233-8320